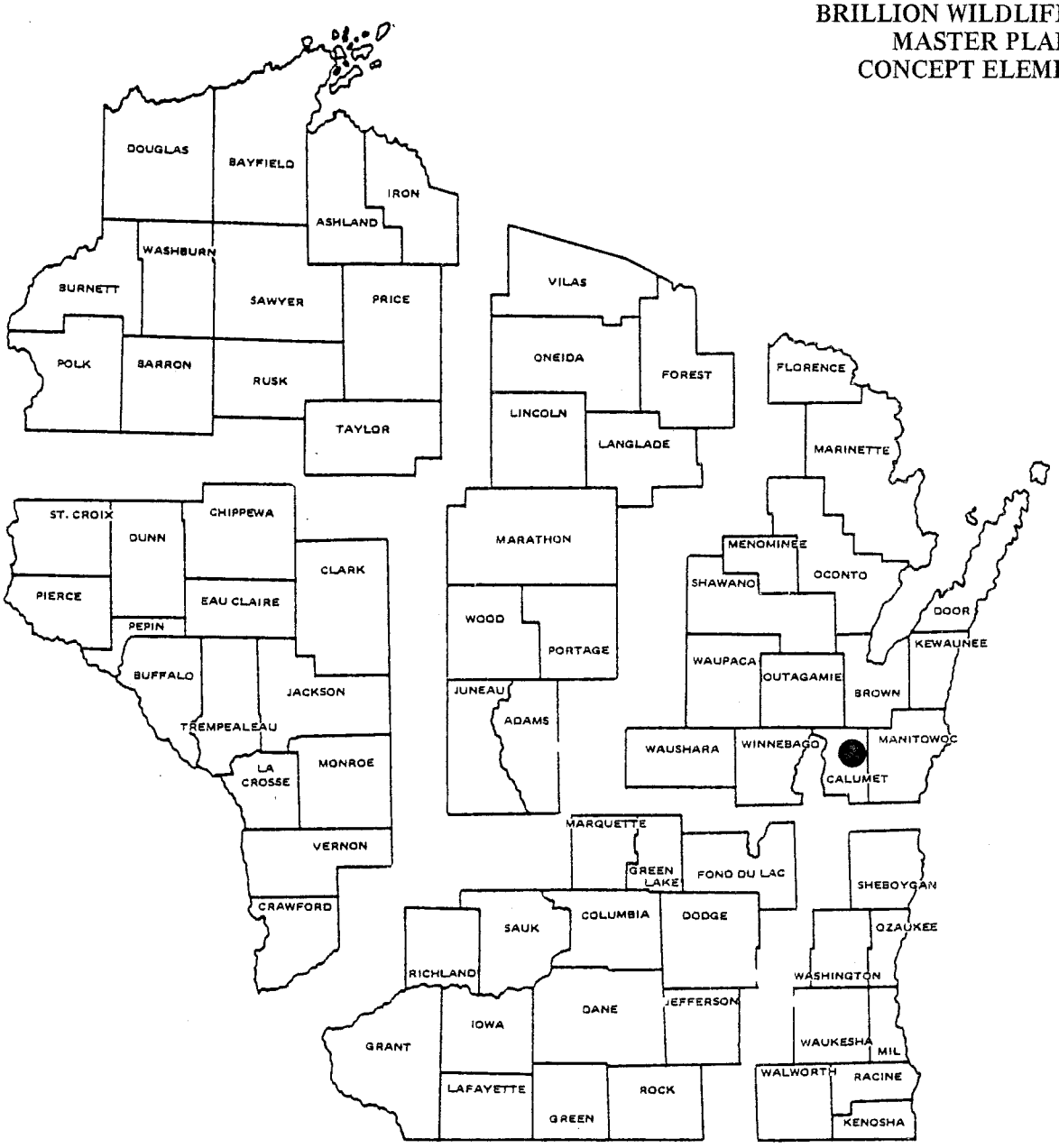
BRILLION WILDLIFE AREA
MASTER PLAN
CONCEPT ELEMENT



PROPERTY TASK FORCE

Leader - Gary Jolin - Area Wildlife Manager
Dave Evenson - Wildlife Manager
Daniel Folz - Fish Manager
Joe Warren - Park Manager
Don Streiff - Forester

Submitted: March, 1979

Approved by Natural Resources Board:

JUL 26 1979

Date

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
MADISON, WISCONSIN

FIGURE 1

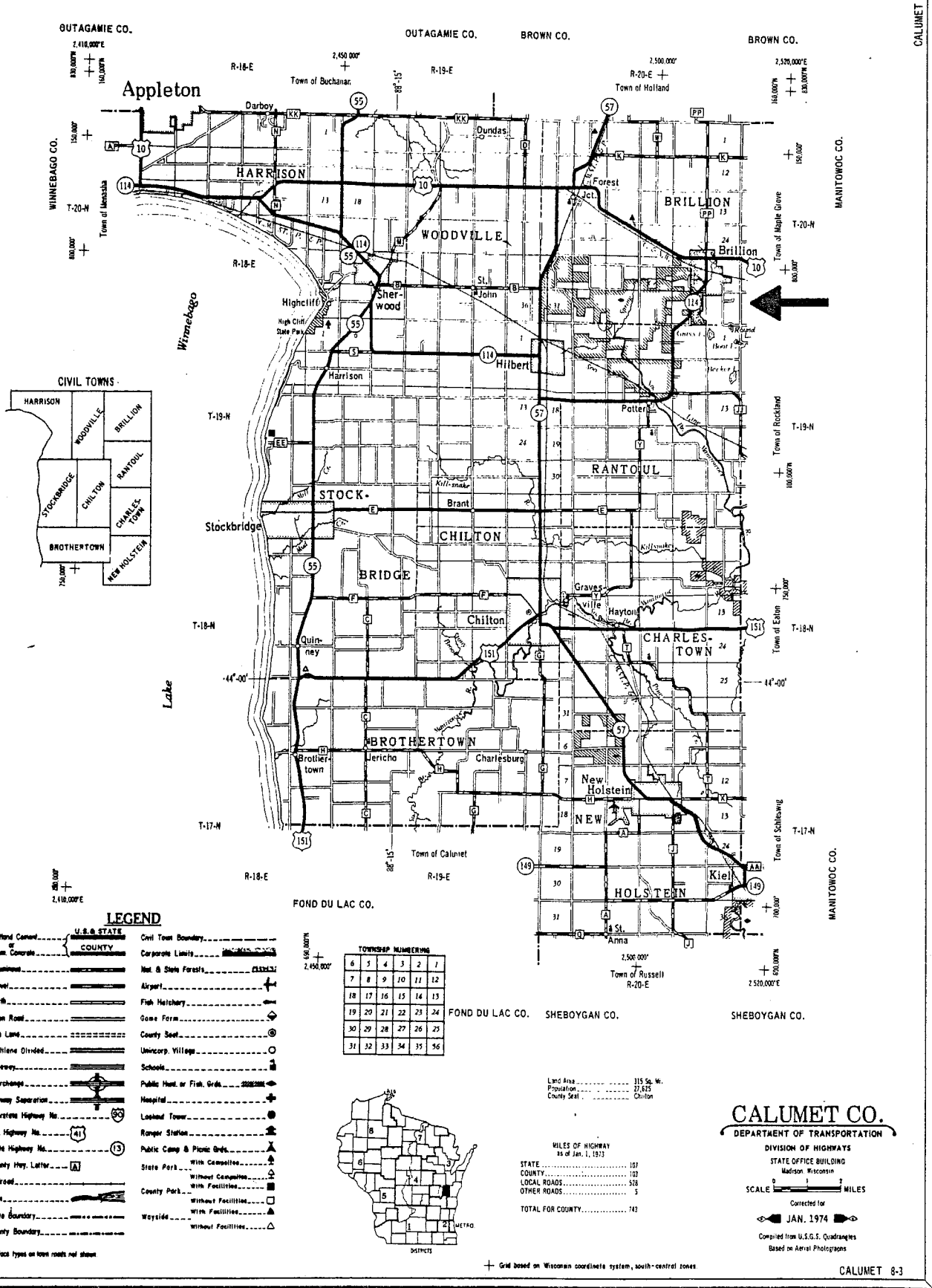

CALUMET 8-3
OUTAGAMIE CO.
BROWN CO.
MANITOWOC CO.
WINNEBAGO CO.
FOND DU LAC CO.
SHEBOYGAN CO.
Appleton
Darboy
Town of Buchanan
Town of Holland
Dundas
HARRISON
WOODVILLE
BRILLION
Brillion
Forest Jct.
Town of Maple Grove
Highcliff
Sherwood
St. John
High Cliff State Park
Hilbert
Harrison
Potter
Town of Rockland
RANTOUL
STOCKBRIDGE
Stockbridge
Brant
CHILTON
BRIDGE
Chilton
Graves-ville
Hayton
Town of Eaton
CHARLESTOWN
Quinney
Lake Winnebago
BROTHERTOWN
Brothertown
Jericho
Charlesburg
New Holstein
NEW HOLSTEIN
Kiel
Town of Schleswig
St. Anna
Town of Calumet
Town of Russell
T-20-N
T-19-N
T-18-N
T-17-N
R-18-E
R-19-E
R-20-E
44°-00'
88°-15'
CIVIL TOWNS
HARRISON
WOODVILLE
BRILLION
STOCKBRIDGE
CHILTON
RANTOUL
CHARLESTOWN
BROTHERTOWN
NEW HOLSTEIN
LEGEND
U.S. & STATE
COUNTY
Portland Cement or Bitum. Concrete
Bituminous
Gravel
Earth
*Town Road
Fire Lane
Multilane Divided
Freeway
Interchange
Highway Separation
Interstate Highway No.
U.S. Highway No.
State Highway No.
County Hwy. Letter
Railroad
Dam
State Boundary
County Boundary
Civil Town Boundary
Corporate Limits
Nat. & State Forests
Airport
Fish Hatchery
Game Farm
County Seat
Unincorp. Village
Schools
Public Hunt. or Fish. Grds.
Hospital
Lookout Tower
Ranger Station
Public Camp & Picnic Grds.
State Park
With Campsites
Without Campsites
County Park
With Facilities
Without Facilities
Wayside
With Facilities
Without Facilities
*Surface types on town roads not shown
TOWNSHIP NUMBERING
6 5 4 3 2 1
7 8 9 10 11 12
18 17 16 15 14 13
19 20 21 22 23 24
30 29 28 27 26 25
31 32 33 34 35 36
METRO DISTRICTS
Land Area 315 Sq. Mi.
Population 27,825
County Seat Chilton
MILES OF HIGHWAY as of Jan. 1, 1973
STATE 107
COUNTY 102
LOCAL ROADS 528
OTHER ROADS 5
TOTAL FOR COUNTY 742
CALUMET CO.
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OFFICE BUILDING
Madison, Wisconsin
SCALE 0 1 2 MILES
Corrected for
JAN. 1974
Compiled from U.S.G.S. Quadrangles
Based on Aerial Photographs
+ Grid based on Wisconsin coordinate system, south-central zone.
CALUMET 8-3

TABLE OF CONTENTS

BACKGROUND INFORMATION

The Brillion Marsh Wildlife Area is located about 10 miles east of the northeast corner of Lake Winnebago in Calumet County. The City of Brillion borders the northeast corner of the project. The village of Hilbert lies 2 miles west of the wildlife area and the village of Potter lies along the southern boundary (Figure 1).

Topography in the vicinity of the project is characterized by flat, broad drainage ways and low rolling hills which surround 4,100 acres of flood plain marsh located at the confluence of Spring Creek with the north branch of the Manitowoc River. The general gradient of the marsh is 1½ feet per mile. The cover map in Figure 2 illustrates the existing types within the wildlife boundary.

DNR involvement in the Brillion Marsh Property dates back to 1947 when the Wisconsin Conservation Department (now DNR) began leasing much of the land within the present project as a public hunting ground. While the potential of the marsh as a duck production and harvest area was long recognized, it was not until 1962 that a formal acquisition project was proposed by the Department, approved by the Conservation Commission and supported by the Calumet County Board. Land acquisition began in 1963 immediately after the project was approved for funding under the Pittman-Robertson Act.

Presently, the Department owns 4,487 acres in fee title and is continuing annual leases on an additional 505 acres (1978) in and adjacent to the wildlife area under the leased Public Hunting Ground program. The property boundary reflects the deletion of 473 acres of primarily agricultural land and two farmsteads as the result of the EIS decision and DNR Board action on May 20, 1976 (Figure 3).

Current management of the project consists primarily of land acquisition and maintenance or improvement of upland sites for the benefit of a variety of wildlife. No development of lowland types has been undertaken. Forest reconnaisance of the project is complete.

Management of upland habitat has been designed primarily to provide undisturbed grass cover for nesting, winter food for deer and pheasant and food or cover for other wildlife where necessary. The undisturbed grass cover developed primarily for nesting also provides very good cover for pheasant hunting in fall. Most of this effort has been by means of the sharecropping program. Approximately 400 acres are presently managed by sharecrop agreements.

Recreational use of the wildlife area consists primarily of hunting pheasants and deer, and to a lesser extent ducks, grouse, rabbits and woodcock. The Department stocks approximately 600 rooster pheasants each fall to supplement the wild population of less than 200 roosters on the area. Local sportsman's clubs also release approximately 300 pheasants, reared under the cooperative day-old-chick program, on the Brillion Wildlife Area. Estimated hunter use for all species is 4000 participant days per year.

Additional uses include about 10 miles of snowmobile trails (part of the Calumet County trail system), and occasional use of 240 acres of upland fields on the north end of the project for dog trials. Non-hunting recreation other than snowmobiling and dog trials is presently rather limited.

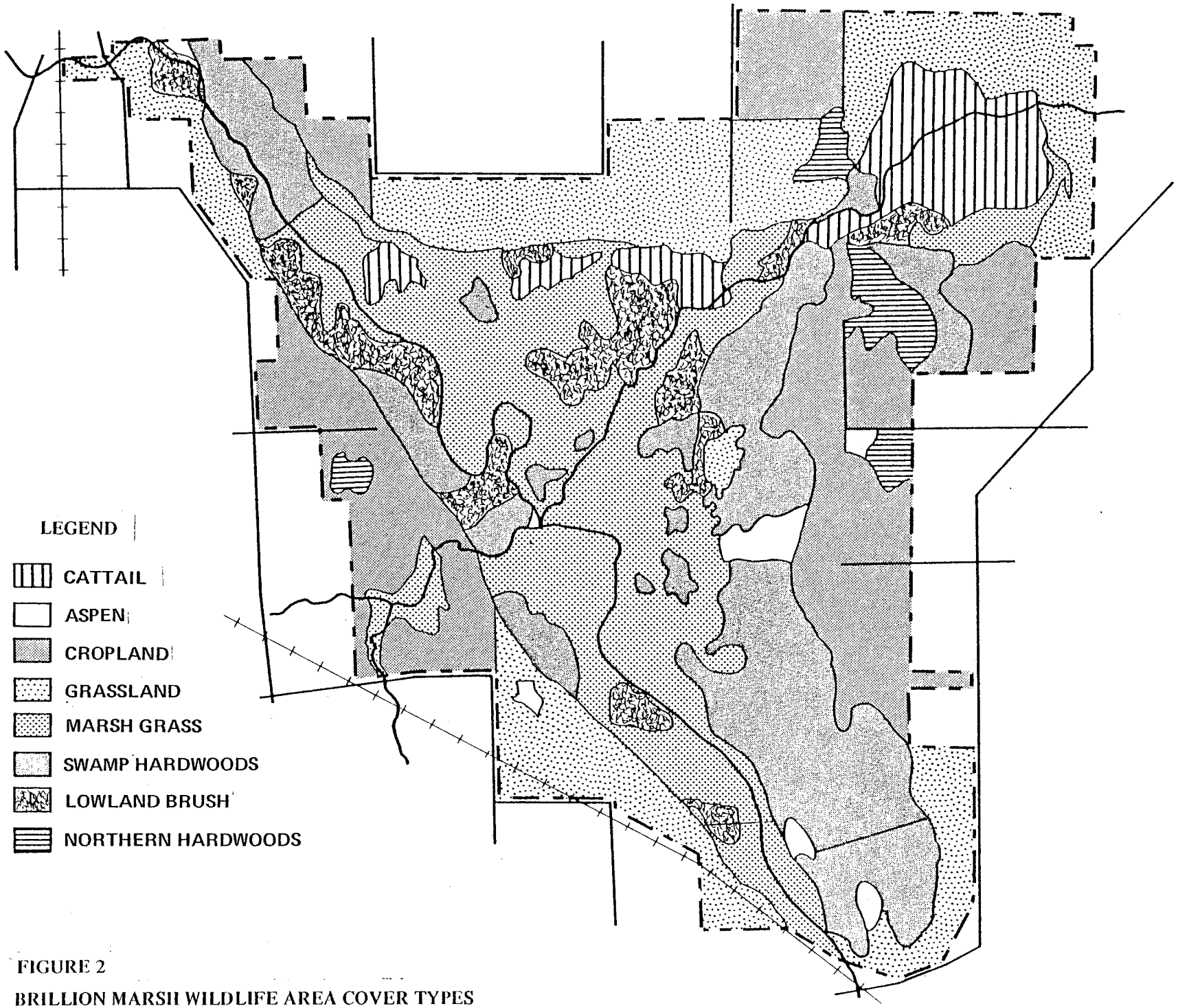


FIGURE 2

BRILLION MARSH WILDLIFE AREA COVER TYPES

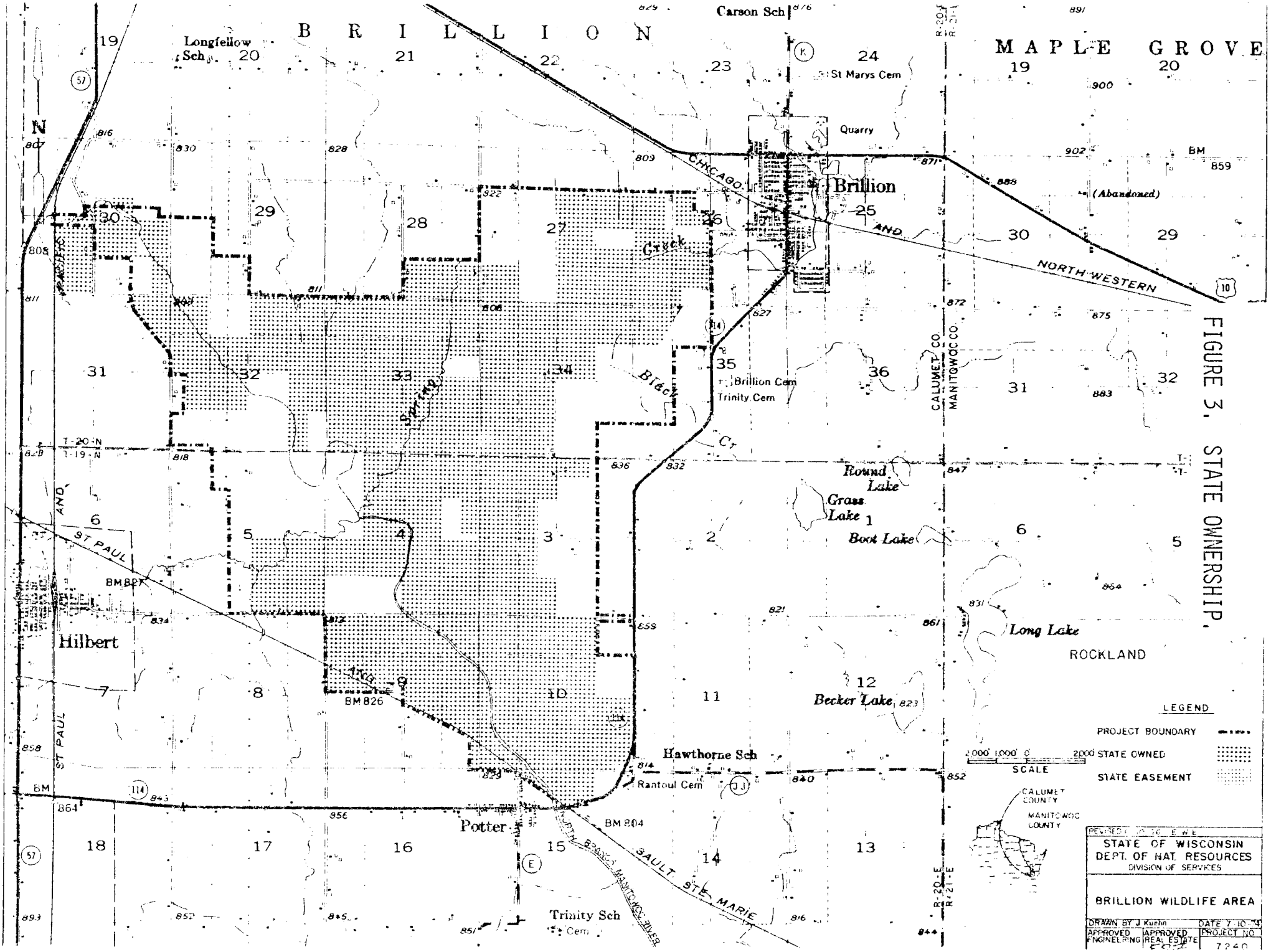


FIGURE 3. STATE OWNERSHIP.

While Calumet county was included within the Oshkosh Area boundary established during the 1970 reorganization of the Department of Natural Resources, transfer of the Brillion Wildlife Property from the Green Bay Area was deferred until additional acquisition and preliminary plans for development were completed. In May, 1976, after completion of the EIS and hearing, Administrative responsibility for the Brillion Wildlife Property was assigned to the Oshkosh Area for implementation, including the development of a Master Plan which incorporates conclusions stated in the Environmental Impact Decision (Appendix).

GOAL AND OBJECTIVES

Goal: To develop and manage the Brillion Marsh Wildlife Area for waterfowl production and a broad spectrum of hunting recreation; and to provide opportunities for educational and compatible non-hunting recreational activities.

Objectives:

1. Produce a minimum of 2,000 ducklings annually by developing and managing 2,200 acres of wetlands and 1,900 acres of upland nesting cover.

2. Provide 8,600 participant days of use consistent with the above objectives and in such manner that it provides a recreational experience of reasonable quality.

	Activity	Participant days
a.	Waterfowl hunting	3,000
b.	Pheasant hunting	2,000
c.	Other small game hunting	1,200
d.	Deer hunting (Bow)	1,200
e.	Dog trials & training	800
f.	Deer (Gun)	400
	Total:	8,600

3. Provide adequate food and cover to maintain a wintering herd of 200-300 deer.

4. Protect a minimum of one scenic area and one historic and archeologic area.

Additional Benefits of Management

1. Both uplands and lowlands will provide habitat suitable for a wide variety of non-game species indigenous to the area.

2. Contribute toward the habitat of migratory threatened and endangered species.

3. Wetlands, when developed, will provide habitat for 15-20 muskrats per acre, on water areas one foot or deeper, with a potential for harvest of approximately 3,000-6,000 annually.

4. Upland timber stands will be managed under sound silvicultural practices and will provide a continuing economic gain for the area. Salvage sales of some lowland timber will provide a small economic return because so little is marketable at a project.

5. Approximately 1,000 participant days of compatible non-hunting uses such as wildlife observation, photography and nut or berry picking can be accomodated.

6. The Brillion Wildlife Area segment of the Calumet County snowmobile trail may have to be rerouted but at least part of it can be accommodated on upland sites.

MANAGEMENT POLICY

A statute which affects the project is the Wisconsin Environmental Policy Act (WEPA). Chapter 1.11, Wisconsin Statutes, WEPA became effective April 19, 1972. The writing of the Brillion Marsh Wildlife Area EIS began during the winter of 1972 - 73. The Preliminary Environmental Report on the Brillion Marsh Wildlife Area was released for public comment on April 22, 1975. The final Brillion EIS was released on October 21, 1975, the public hearing was held on December 4, 1975, and the statement was determined to be adequate on April 5, 1976.

The Natural Resources Board Policy on Master Plans was approved on July 19, 1974. On June 2, 1976, a task force was appointed to write the Brillion Marsh Wildlife Area Master Plan. The Natural Resources Board policy on Wildlife Management, Section NR 1.015, was adopted in February 1977 and Section NR 1.51 pertains specifically to the management of State Wildlife Areas.

RESOURCE CAPABILITY

Soils and Geology:

Brillion Marsh Wildlife Areais located on the glacial drift-covered back slope of the Niagara Cuesta. The upper surface is a thin mantle of recent soils and alluvium developed from Pleistocene deposits of the Wisconsin stage of glaciation. These Pleistocene deposits are underlain by Niagara dolimite of silurian age, over a thick sedimentary sequence of Cambro- Ordovician Paleozoic rocks. These rocks are underlain by the Precambrian igneous basement rock at a depth of 12,000 feet.

Much of the lowland area is covered with Suamico and Seelyeville mucks which are very poorly drained deep organic soils, ranging from a few feet to more than 20 feet in depth. The third most common soil in the project area is Poygan silty clay loam, which is poorly to very poorly drained. All of the above soils have a high water table throughout most of the year and are unsuitable for cultivation. The most common soils on the uplands are Manawa silt loam, a somewhat poorly drained clayey soil, and Kewaunee loam, which is a well to moderately well drained clayey glacial till. These upland soils are suitable for cultivation.

Wild fire burned over 2600 acres of Brillion Marsh in the fall of 1976. The fire burned into the organic soil in a 500 acre area causing scattered peat holes 1 to 3 feet deep and 10 to 30 feet in diameter.

Fish and Wildlife:

Brillion Marsh is presently occupied by species of wildlife common to farm fringe, wetland and forest. Common game mammals include the white-

tailed deer, cottontail rabbit, fox squirrel, gray squirrel, and red fox. The gray fox and coyote are present, but uncommon. Mammals that are classified as furbearers include muskrats, mink, raccoon, striped skunk, and weasel.

Common game birds and non-game birds that are present and would respond to management are blue-winged teal, mallard, wood duck, coot, pheasant, woodcock, great blue heron, red-winged blackbird and various species of sparrow. Canada geese occasionally nest in the marsh. Whistling swans use Brillion Marsh as a migrational resting place. Yellow-headed blackbirds and sandhill cranes also use the area. Ruffed grouse and Hungarian partridge are present in small numbers. Harriers (marsh hawks) and bald eagles, (an endangered species), have been observed on the area. Bob-o-link can be expected to respond favorably to the development of additional permanent cover on the uplands.

On the North Branch of the Manitowoc river, carp, black bullhead, and mudminnow are common, while sunfish, bluegills, northern pike and other minnows are present in low numbers. Fathead minnows, white suckers and sticklebacks are common in Spring Creek, which also holds sunfish, bullheads and carp. Minnow species are abundant in Black Creek, a tributary to Spring Creek. Due to the sluggish flow of water through the Brillion Marsh, as well as the periodic low oxygen content, there is little sport fishery.

Complete lists of mammals, birds, fish, reptiles and amphibians that may be present on the wildlife area can be found in the Environmental Impact Statement (EIS).

Vegetative Cover: (Figure 2)

There are 2,090 acres of cleared farmland present within the project boundary. Present vegetation includes corn, oats, and alfalfa on most of the farmland not yet owned by the Department, and on some of the sharecropped lands. Some 440 acres are in undisturbed nesting cover consisting of brome grass, bluegrass, quackgrass and retired alfalfa-clover fields.

The marsh-grass type and lowland brush together account for some 2,105 acres. The marsh-grass is primarily canary grass and bluejoint grass with small pockets of cattail. Red osier dogwood, elderberry, spirea, willow and alder make up most of the lowland brush. Species growing in association with the lowland brush are stinging nettles, jewelweed, and lowland asters. Nearly monotypic stands of cattail cover another 420 acres.

The predominant wooded type is swamp hardwoods (809 a.), including black ash, red maple, willow, American elm and balsam poplar. Understory components of the swamp hardwoods include reproduction of the above species as well as tag alder, red osier dogwood, elderberry and raspberry. Herbaceous plants include lowland asters, jewelweed, stinging nettles and canary grass. There are two stands of aspen totalling 133 acres. Red maple and willow are also scattered throughout the aspen. The understory consists of aspen reproduction, red osier dogwood, sumac and Juneberry. Herbaceous plants include sensitive fern, aster, goldenrod and stinging nettle.

While the swamp hardwoods and aspen stands cover a large area, they are generally of poor quality and inaccessability gives them a low monetary value.

Woodlots containing eighty-seven acres consist of northern hardwoods. These contain oak, sugar maple, basswood, ash and American elm. The understory is northern hardwood reproduction, gray dogwood and prickly ash. Bluegrass, quack grass, asters, goldenrod and ragweed are also present.

Vegetation Types on Brillion Marsh Wildlife Area

Type	Acreage
Agricultural	2,090
Lowland brush	1,120
Marsh grass	985
Cattail	420
Swamp hardwoods	809
Aspen	133
Northern hardwoods	87
Railroad-right-of-way, etc.	70
	5,714

Water Resources:

The North Branch of the Manitowoc River originates north and west of Brillion Marsh and flows through it to join the Manitowoc River which discharges into Lake Michigan. Tributaries to the main river within the wildlife area boundary include Spring Creek and Black Creek, flowing from the northeast and east respectively, as well as an unnamed drainage flowing from the west, another creek flowing from the south and several drainage ditches. The watershed of Brillion Marsh is approximately 73 square miles in size.

Mean annual discharge for the North Branch of the Manitowoc River at Potter has been determined by several different methods to be between 18 and 43 cfs., according to the United States Geological Survey (USGS). The normal annual pattern includes a peak spring flow followed by a period of essentially no flow in summer and fall. Measurement late in 1974 indicated no flow in the North Branch of the Manitowoc at Potter, and no flow in Spring Creek where it joins the North Branch.

Flooding commonly occurs in the Brillion Marsh watershed. Runoff from the drainage basin is stored in the Brillion Marsh (or elsewhere in the floodplain of the Manitowoc River) and is released slowly through the natural point of control at Cato Falls, some 20 miles downstream. This creates high water levels of fairly long duration which attract large

numbers of migratory waterfowl in spring, however, flood waters ordinarily recede before most duck broods hatch, leaving the ducklings without adequate shallow water areas. Flooding of Spring Creek within the City of Brillion is common and occurs primarily because of bridges and structures within the City of Brillion itself.

The North Branch of the Manitowoc River and Spring Creek both are turbid, hard-water streams with muck and silt as the most common bottom materials. Runoff from surrounding croplands and treated waste water from Hilbert and Brillion contribute a large amount of nutrients and create a very fertile environment. This eutrophic situation produces vigorous aquatic plant growth which is valuable as food and cover for many species of marsh birds and mammals, but especially for young ducklings. The high level of plant growth supports a large population of invertebrate animals which are an excellent food source for ducklings. While the quality of aquatic habitat for ducks is high, the amount of shallow water area is currently very limited.

Both the communities of Brillion and Hilbert are planning tertiary sewage treatment plants which will remove pollutants, but will continue to contribute nutrients to the marsh. This will assure a high basic productivity which, with the addition of more shallow water areas can support a substantial population of wetland wildlife.

Historical and Archeological features:

Features which are or may be of historical significance in the Brillion Marsh Area include an abandoned lime kiln, an old maple sugar shack and a blacksmith shop within a log cabin. These buildings are all located in Section 3, Township 19 North, Range 20 East. In addition to the buildings above, a few Indian artifacts, flint projectiles, knives and axes have been found on upland sites in several other parts of the wildlife area.

Close liaison will be established with the Historic Preservation Division of the State Historical Society to ensure that archeological reconnaissance and evaluation is completed prior to development of any portion of the Wildlife Area.

Ownership: (Figure 3)

The property ownership goal is 5,306 acres, of which 4,487 have been purchased to date. Seventy-five acres of surplus land combined with the remaining acreage goal will be utilized to acquire about 15 of the 25 tracts of private land lying within the property boundary. Seven of these 15 tracts contain about 500 acres of wetland and need to be acquired before the major flowage can be constructed.

The remaining tracts will be acquired by negotiation as they become available. Based on current values, the estimated costs will be $640,000 plus approximately $65,000 for relocation for a total of $705,000. The farmsteads are included in this estimate.

Current Use:

Brillion Marsh Wildlife Area is used primarily by hunters at the present time. An estimated 4,100 hunting and trapping visitations are made to the project each year. These include 1,600 participant-days for pheasants, 1,200 days for deer, 1,000 waterfowl hunter days, 200 participant-days for other small game, and 100 trapper visitations.

An estimated 2,000 participant-days are made to the Brillion Marsh for other recreational uses. This includes 800 days involving dog trials or dog training, 600 days for snowmobiling and 600 visits by berry and muhroom pickers or people observing nature, including wildlife.

Land Use Potentials:

The Department's uniform system of land use classification has been used to designate the land-use potentials of the project, and appropriate symbols entered on the Development Map (Figure 4).

The majority of the project is RD2 - Wildlife Management Area.

A scenic area (Sc) is located in Section 34, Township 20 North, Range 20 East. This consists of 90 acres of northern (upland and swamp) hardwoods. Dominant species within the stands are red oak, sugar maple, basswood and ash. This site is adjacent to the proposed nature center, and will contain a trail for hiking and nature study. This stand will be managed under appropriate silvicultural practices that will yield wood products but still maintain the aesthetic and educational values of the stand.

An Historic and Archeologic Area (HA) is located in the Northwest One-Quarter, Northeast One-Quarter of Section 3, Township 19 North, Range 20 East. This site contains a lime kiln and a maple sugar shack within a 20-acre northern hardwoods stand, and a log cabin blacksmith shop on the adjacent homestead. Vehicle access to the structures will be blocked and an interpretive (foot) trail through the woods will be developed. This forest stand will also be managed by means of appropriate cultural techniques. Interpretive signs will be placed at strategic locations including the lime kiln, sugar shack and blacksmith shop. Additional interpretations will be available in the future at the nearby Nature Center.

Nine Intensive Recreation Development Areas (IRD) are planned. These include eight parking lots, and a Nature Center. The Nature Center will be developed on a former farm where present buildings can be used. The development and operation of the Nature Center will be by means of private donations or community involvement through schools, youth groups, etc.

RESOURCE MANAGEMENT PROBLEMS

Wildlife habitats on the project vary widely in value to different species and by time of year. Most of the lowland acreage is too wet for upland species or waterfowl nesting, yet too dry for waterfowl brood rearing. Sheet water present during the spring and early summer attracts breeding ducks, but is completely gone by early to mid-summer when it is needed by broods. Privately-owned upland acreage within the approved property boundary is intensively farmed and is not managed specifically to meet wildlife habitat needs.

Intensive farming practices on private lands and increasing hunter numbers are such that more and more hunters are concentrating their efforts in smaller areas each year, particularly on public lands. The most intense public use of the Brillion Wildlife Area is presently limited to the opening days for pheasant, deer, and waterfowl hunting. Of these, pheasant hunting has the highest pressure. Crowding fosters excessive competition which results in some unsatisfactory encounters among hunters, non-hunters and local residents.

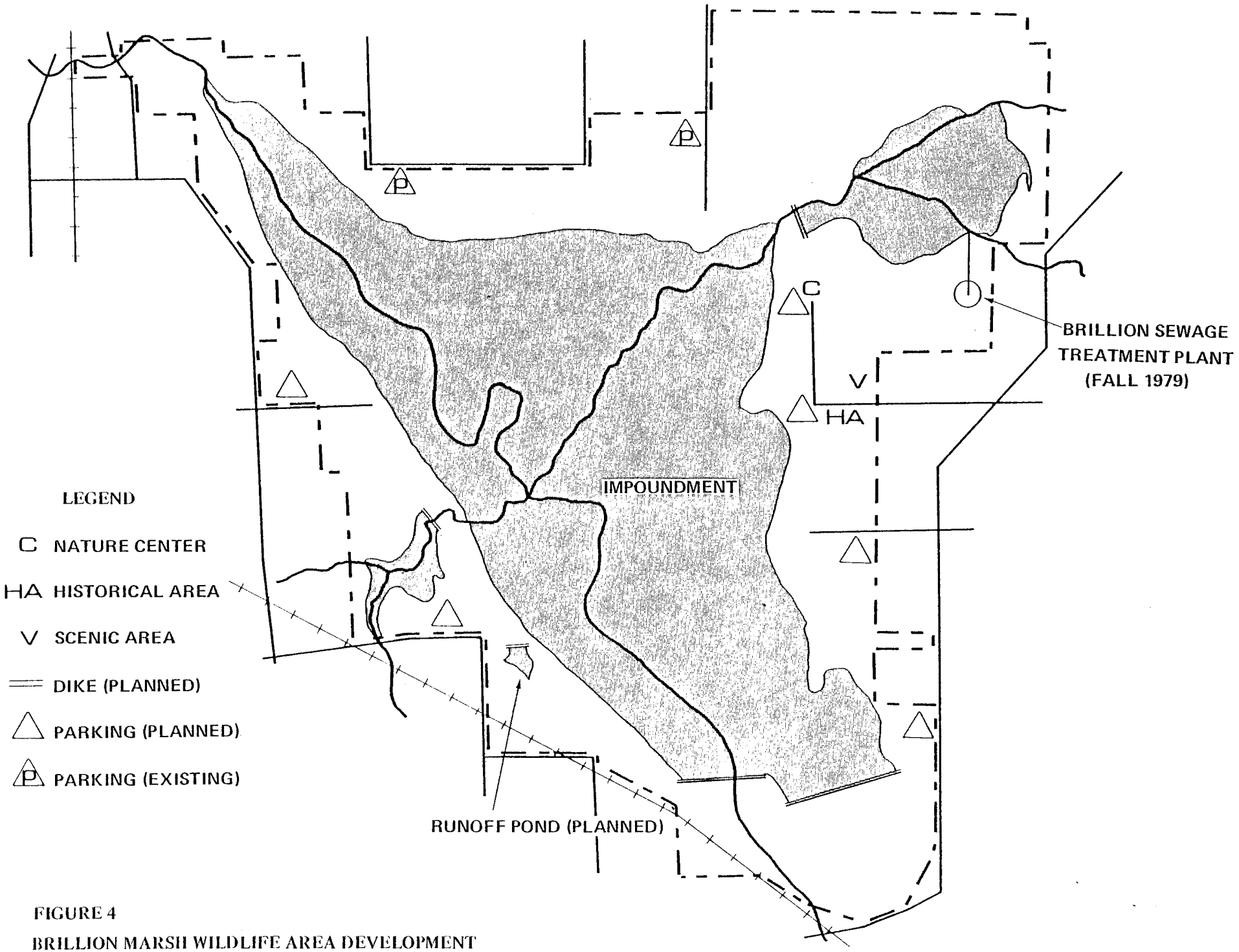


FIGURE 4
BRILLION MARSH WILDLIFE AREA DEVELOPMENT

The construction of a large flowage is likely to increase competition among waterfowl hunters even though there will be a two or three-fold increase in waterfowl hunting opportunity.

After construction of the main dike, this property will be capable of producing at least 2,000 ducks annually. If hunting pressure is completely unregulated, in some years it is possible that more than 2,000 ducks will be harvested.

For highly mobile species, such as waterfowl, permissable harvest has to be assessed on a regional basis but since the current need for additional ducks is somewhat greater than the need for more places to hunt them, harvest levels on this property should be kept reasonably proportional to production.

Carp are present in the Manitowoc River System and will be present within any impoundment. Proposed over-winter drawdowns will allow the marsh to freeze down and probably kill most of the carp. Carp are not expected to be a major problem but there is a chance that occasional negative management measures or chemical treatment may be required for their control.

Because of the extremely flat basin, the limited summer flow within the marsh and the proposed management scheme, occasional outbreaks of botulism may occur. Botulinum clostridium, the causative bacteria, is present almost everywhere in resistant spores, but certain conditions are necessary for it to become active. Hot weather, receding mudflats, an anaerobic condition, and dead animals of some kind are necessary to trigger an outbreak of botulism. Control of an outbreak, should it occur, includes either completely draining the basin to make it unattractive to ducks or quickly flooding the basin to move feeding ducks away from the affected area. Picking up and burning all dead birds is also a crucial step. At Brillion Marsh complete dewatering and sanitation are probably the only feasible management techniques since there is not a dependable reservoir from which water can be drawn to increase the depth of the flowage.

Within the wildlife area boundary, there are 24 tracts which are still in private holdings. Of these, 10 are needed for any major flowage development. Continued acquisition contacts have been made with all of the landowners involved, and most are not interested in selling. There is opposition to the development of a major flowage on the part of some local hunters who appear to be more interested in hunting deer and stocked pheasants than waterfowl. They do not want a waterfowl development which will attract large numbers of outside hunters. There is also some concern by landowners that a goose population would cause depredations on surrounding farms.

The most significant and continuing threat to maintaining a productive waterfowl flowage may be excessive cattail establishment and encroachment. From research and experience it has been found that exposed mudflats during the months of June and early July provide the necessary seedbed for the germination of cattail seeds. If, as a result of vandalism to the control structure, or a very unusual water year, a large mudflat is allowed to occur during June or early July that portion of the marsh

will probably become a monotypic cattail stand. The most thorough and economical cattail control method, that of raising and holding water levels at about three-four feet, is not applicable to much of Brillion Marsh because of adverse effects on surrounding farmland. Other cattail control methods such as mechanical or chemical means are either very expensive, or are not feasible due to peat depths, basin conformation or environmental regulations. Muskrat activities in cattail areas where water is over 1 foot in depth will be the most effective way to keep those areas productive for waterfowl.

Two parcels of land outside the project boundary may be adversely affected if the Department floods the Brillion Marsh basin to the 804 contour. Further evaluation will be required prior to development to make this determination and justify any necessary project boundary revision.

Forest reconniassance indicates that there are swamp hardwoods and aspen worth an estimated $39,300 at the lumber mill to be found within the main basin of Brillion Marsh. An effort will be made to harvest some of this timber prior to any flooding, but if present market conditions continue, this may not be possible. The swamps hardwoods and aspen are generally poor in quality and poor access further limits its marketability. The management of any future flowage will be designed to maintain timber types as long as possible because of their wildlife habitat values.

The City of Brillion is contemplating the construction of a tertiary sewage treatment plant, south of the city and within the wildlife area boundary. Discharge from this plant will be into black Creek and thence into the marsh basin. Water quality will be greatly improved from that received in Spring Creek at present. An odor will be present at the plant, but prevailing winds will take it away from the marsh.

LONG RANGE RESOURCES, RECREATION NEEDS AND JUSTIFICATION

The 1970 census indicates a population of 27,604 for Calumet County, an increase of 24% in 10 years. While population projections for the county indicate a county total of 38,000 people by 1990; these data do not reflect the increasing use of outdoor recreation facilities in Calumet County by prople residing in the highly urbanized Fox River Valley. Within 50 miles of Brillion there are nine cities which contain 8% of the State's population, or 363,551 people, according to the 1970 census. Region 7* has a population density of 169 people per square mile, only to the very highly urbanized southeast part of the State.

Sightseeing:

Residents of Region 7 generate sightseeing recreation occasions at a rate equal to the state average. However, less than 35% of this demand is satisfied within the region and out of State visitors account for 65% of total sightseeing demand in region 7. Calumet County offers scenic views of Lake Winnebago, the Niagara Cuesta, as well as the northern fringes of the Kettle Moraine. Sightseeing recreation is expected to increase an estimated 25% by the year 1990.

*From the Wisconsin Comprehensive Outdoor Recreation Plan. Region 7 includes Outagamie, Calumet, Winnebago and Fond du Lac Counties.

There are numerous historic and archeological sites listed for Calumet County by the State Historical Society. Sightseeing, more than other recreational activities, requires a scenic vista or wildlife that is easily observed and protection from land-use changes which would destroy them. Some sightseers take advantage of the scenic views and wildlife activity now, but a marked increase is likely if a major flowage were to be constructed.

Better information systems and signing programs will be needed to accommodate sightseers, photographers and bird watchers.

Hiking and Nature Study:

Although classified as hiking trails most of the trails in Region 7 are short loop trails designed for casual walking. Short loop trails are to be developed on the Brillion Marsh Wildlife Area in conjunction with a local school district or other interested sponsoring organizations. Trails will be developed and signed with interpretive markers to facilitate nature study and explain the management of the wildlife area. While there is a regional need for long distance hiking trails, Brillion Marsh does not have much potential to meet this need.

Hunting:

The population density of Region 7 is steadily encroaching on the recreation-resource base. Many private lands are being lost to other uses or are posted against any form of trespass. Moreover, the quality of wildlife habitat available is steadily decreasing. Hedgerows, woodlots and odd corners are being cleared and farmed. Productive waterfowl habitat consisting of brood water combined with undisturbed grassy nesting cover is in very short supply.

Along with the decreasing habitat base, an increasing number of people are participating in hunting activities. Existing resources cannot satisfy the projected demand for high quality recreational hunting experiences in Region 7. Current trends in habitat loss, posting and numbers of hunters could easily discourage participation increases anticipated by 1980 and 1990:

Number of Annual Hunting Occasions - Region 7:

1970 - 650,746 occasions

1980 - 766,671 occasions

1990 - 904,011 occasions

Efforts directed toward maintaining quality recreational hunting opportunities must include both the conservation and development of wildlife habitat in important areas like the Brillion Marsh.

Snowmobiling:

In Planning Region 7, intensive land use patterns and climatic conditions limit snowmobiling activities. Privately owned lands satisfy the preponderence of demands. The present snowmobile trails through Brillion Marsh run

over lands which would be flooded in any type of major development. These trails, which are part of the Calumet County trail system, will have to be rerouted because trails in the county trail systems are not permitted to run over ice. The use of snowmobiles off of designated trails will not be allowed.

ANALYSIS OF ALTERNATIVES

There are no known cost-effective, alternative ways to achieve the primary objectives for the Brillion Marsh Wildlife Area without the construction of the proposed main dike and flowage. Annual objectives would have to be scaled down to less than 500 ducklings and 1,500 participant days of waterfowl hunting respectively. Anticipated increases in non-hunting wildlife observation and muskrat production resulting from a major flowage would also be lost.

Only 2 opportunities for secondary impoundments have been identified. One of those is relatively expensive because it will provide only 50 acres of wetland. Dug ponds or level ditches are very expensive. If they are to be large enough to rear duck broods, they generally are poorer in quality than flowages and there is the problem of spoil deposition. There are no opportunities for runoff ponds of any size without obstructing ditches draining adjacent private farmlands. Very small runoff ponds are no substitute for a 2,500 acre flowage in terms of the number of ducklings they will support.

If the main dike and flowage are not constructed, the property will continue to winter 200-300 deer without any additional management actions. With construction, some sharecrop foods and/or conifers and upland brush may have to be provided to replace lowland browse and cover that will be lost over a period of years. Without construction of the main dike and flowage, the property will stay essentially as it is in regard to wildlife population and wildlife-oriented recreation including hunting, and trapping. Total user days will gradually increase from the current 4,000 to, perhaps, 5,000 because numbers of people and social pressures for the use of public land will continue to increase in region 7. The projection is based on the assumption that the State of Wisconsin will continue to release at least 500 pheasant cocks annually and that approximately 300 additional cocks reared by Calumet County Sportsmen's clubs via the day-old-chick program will continue to be released on the Brillion Marsh Wildlife Area.

RECOMMENDED ALTERNATIVE ACTION

While the Department feels that, in the long run, construction of the main dike and flowage is the only cost-effective way to achieve project objectives there are certain present limitations to the implementation of this alternative. Department ownership of the flowage basin will not be completed in the near future and this major development requires complete ownership. The final decision on the main dike should be made at the time that basin ownership is complete. The decision can then be made in light of any new changes in technology, economics, biological needs or sociological desires.

Therefore, in the interim only actions which are compatible with eventual construction of the main dike and flowage should be undertaken. The concept plan can be reconsidered when the necessary land acquisition is complete in light of local and regional needs present at that time. Development, which is consistent with eventual construction of the main dike, includes construction of the 250 acre Spring Creek impoundment, restoration of an unobstructed channel in Spring Creek and construction of the Southwest impoundment. Upland fields will be developed to provide nesting habitat, escape and winter cover. Five to six parking areas of the 8 proposed will be developed. These initial efforts will be concentrated on upland areas now in state ownership.

Upland habitat development will create and improve habitat for small game mammals, upland game birds and non-game species. Education and compatible recreational uses of the project will be facilitated. All necessary development should blend with or improve the visual character of the project. Cross country skiing, hiking, nature interpretation and observation will be permitted so long as they do not reach levels which create user group conflicts or negative impacts on wildlife habitat and populations. Special efforts will be made to avoid public abuse of any historic or archeological site on the wildlife area.

No waterfowl closed area or refuge is recommended at the present time. Duck production is the primary objective, and goose use will thus be restricted to occasional visits by migrants.

Consistent with the recommended actions, the major portion of the Brillion Marsh Wildlife Area will be classified as a Wildlife or Fisheries Management Area (RD2), with small Historical or Archeological Areas (HA), one Scenic Area (Sc), and eight Intensive Recreational Developments (IRD). Land within the Wildlife Area boundary will be purchased as rapidly as negotiations and acquisition procedures permit. About 15 private tracts of land remain to be acquired, at an estimated cost of $705,000.00. The acquisition rate is estimated at about 100 acres per year for the next ten years. Three privately owned tracts in the proposed Spring Creek flowage basin remain to be acquired prior to development. The target date for completion of this small flowage is within the 1979-1981 biennium. Current estimated development costs for this 250-acre flowage and the restoration of an unobstructed channel in Spring Creek are about $65,000.00.

Development of the Nature and Education Center could be initiated at any time, but would logically follow or run concurrent with development of the Spring Creek flowage because of the added educational opportunities it would offer. It is anticipated that costs for establishment and operation of the center will be provided by private donations and community involvement. The only State costs beyond those already incurred will be through involvement in the planning and development phase of the center. A target date for completion of this phase would be in the 1979-1981 biennium along with the Spring Creek Impoundment or shortly thereafter.

Chronological Order of Development:

Acquisition (continuing)

Dense nesting cover (continuing)

Hedgerow, food patch development (continuing)

Spring Creek Impoundment and restoration of an unobstructed channel in Spring Creek (250 a.)

Nature Center development

Parking lot construction

Secondary Impoundment(s)

Salvage timber harvest

Main dike construction

Current operating costs are approximately $15,000.00 annually. An additional 7-8 man-months of labor will be required for operations once the development phase, including the main dikes, is completed. Major expenditures of time and manpower initially will be for nesting cover establishment and vegetation control so approximately 3-4 man-months of labor will be required before the main dike and flowage is constructed.

If the main dike and flowage are constructed, it may be necessary to limit hunter numbers during peak use periods. This almost certainly would be the case <u>if</u> waterfowl closed areas or refuges were to be added in the future.

Many of the values associated with the hunter experience are intangible and depend, in part at least, upon hunter density and related factors. The Department should seek authority to control hunter numbers to assure reasonable opportunities to obtain a quality hunting experience on state waterfowl projects and to assist in regulating the harvest of waterfowl to protect the breeding population.